

### **ALLOWANCE**

1. The following is an Allowance in response to communications filed on 8/12/2009.
2. Claims 1-9 and 11-17 and 19-23 are pending, and claim 10 is cancelled.

### **Examiner's Amendment**

3. Authorization for this examiner's amendment was given in a telephone interview with Attorney Lowell W. Gresham on December 17, 2009.

4. An examiner's amendment to the record appears below. Claims 1-9 and 11-17 and 19-23 are pending. Claims 10 and 18 are cancelled. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

### **Amendment to the Claims**

1. (Currently Amended) In a planning model characterizing an enterprise, a method of computing decisions ~~in a computing environment~~ for a set of decision variables comprising:

generating, in a processing section having one or more processors, a planning function describing said planning model, said planning function depending upon said set of decision variables;

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separating, in said processing section, said planning function into independent planning functions, each of said independent planning functions depending upon different ones of said set of decision variables;

independently optimizing each of said independent planning functions ~~in said computing environment~~ in said processing section to obtain said decisions for said different ones of said set of decision variables, wherein said independently optimizing operation comprises selecting an optimization algorithm from a group comprising a closed form solution, a one dimensional maximization of continuous decision variables, a one dimensional maximization of discrete variables, and a general multidimensional method; and

~~presenting an outcome of said optimizing operation at~~ controlling said processing section to cause an output section of ~~said a computing environment~~ to present an outcome of said optimizing operation, said outcome indicating said obtained decisions.

2. (Original) A method as claimed in claim 1 wherein said generating operation defines said planning function to be a non-linear function of at least one of said decision variables.

3. (Original) A method as claimed in claim 2 wherein said non-linear function is continuous.

4. (Original) A method as claimed in claim 2 wherein said non-linear function is discontinuous.

5. (Currently Amended) A method as claimed in claim 1 wherein:  
said planning model incorporates a primary objective and a strategic objective of said enterprise;  
said method further comprises:

defining, in said processing section, a primary objective function describing said primary objective, said primary objective function including said set of decision variables; and

defining, in said processing section, a strategic objective function describing said strategic objective, said strategic objective function including a subset of said decision variables; and

said generating operation incorporates said primary objective function and said strategic objective function within said planning function.

6. (Currently Amended) A method as claimed in claim 5 further comprising:  
specifying, in said processing section, a plurality of values for a strategic factor, said strategic factor being configured to adjust an influence that said strategic objective has on said planning model; and

coupling, in said processing section, said strategic objective function with said strategic factor.

7. (Original) A method as claimed in claim 6 wherein said independently optimizing operation optimizes said independent planning functions for each of said values of said strategic factor.

8. (Currently Amended) A method as claimed in 5 wherein:  
said strategic objective is a first strategic objective;  
said method further comprises defining, in said processing section, a second strategic objective function describing a second strategic objective of said enterprise, said second strategic objective function including a second subset of said decision variables;

said generating operation further incorporates said second strategic objective function within said planning function; and

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said presenting operation comprises providing an interaction of said primary objective function, said first strategic objective function, and said second strategic objective function.

9. (Currently Amended) A method as claimed in claim 8 further comprising:  
specifying, in said processing section, a plurality of values for a second strategic factor, said second strategic factor being configured to adjust an influence that said second strategic objective has on said strategic planning model;  
coupling, in said processing section, said second strategic objective function with said second strategic factor; and  
said optimizing operation further includes independently optimizing said planning function for each of said second values of said second strategic factor.

10. Canceled

11. (Currently Amended) A method as claimed in claim 1 wherein said planning model incorporates a primary objective of said enterprise, and said method further comprises:  
defining, in said processing section, a primary objective function describing said primary objective, said primary objective function including said set of decision variables, and said generating operation incorporating said primary objective function within said planning function;  
determining, in said processing section, a coupling between said decision variables in said primary objective function;  
introducing, in said processing section, an embedded constraint into said primary objective function; and  
following said introducing operation, performing said independently optimizing operation to optimize said primary objective function while concurrently satisfying said embedded constraint.

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12. (Original) A method as claimed in claim 11 wherein:  
said introducing operation comprises:  
including an embedded constraint variable for said embedded constraint in said primary objective function; and  
defining an embedded constraint function to include said embedded constraint variable;  
said generating operation comprises constructing said planning function by combining said primary objective function and said embedded constraint function; and  
said independently optimizing operation comprises providing said decisions which optimize said primary objective function while concurrently satisfying said embedded constraint function.

13. (Original) A method as claimed in 12 further comprising:  
specifying a plurality of values for a constraint factor, said constraint factor being configured to adjust an influence that said embedded constraint has on said planning model; and  
coupling said embedded constraint function with said constraint factor.

14. (Original) A method as claimed in claim 13 wherein said independently optimizing operation optimizes said independent planning functions for each of said values of said constraint factor.

15. (Currently Amended) A method as claimed in claim 1 wherein said ~~presenting~~ controlling operation ~~comprises providing~~ causes said output section to provide said decisions for said different ones of said set of decision variables that optimize said each of said independent planning functions.

16. (Currently Amended) A method as claimed in claim 1 wherein said ~~presenting~~ controlling operation ~~comprises providing~~ causes said output section to provide a plurality of scenario points, each of said plurality of scenario points being

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associated with said decisions for said decision variables that optimize said each of said independent planning functions.

17. (Currently Amended) A computer-readable storage medium containing code executable by a computer, said code instructing said computer to compute decisions for a set of decision variables of a planning model characterizing an enterprise, said planning model incorporating a primary objective and a strategic objective of said enterprise, and said code instructing said computer to perform operations comprising:

defining a primary objective function describing said primary objective, said primary objective function including said set of decision variables;

defining a strategic objective function describing said strategic objective, said strategic objective function including a subset of said decision variables;

generating a planning function describing said planning model, said generating operation incorporating said primary objective function and said strategic objective function within said planning function, and said planning function including a non-linear function of one of said decision variables;

separating said planning function into independent planning functions, each of said independent planning functions depending upon different ones of said set of decision variables;

independently optimizing each of said independent planning functions in said computer to obtain said decisions for said different ones of said set of decision variables; and

presenting an outcome of said optimizing operation at an output section of said computer, said outcome indicating said obtained decisions;

wherein said executable code identifies selection of an optimization algorithm from a group comprising a closed form solution, a one dimensional maximization of continuous decision variables, a one dimensional maximization of discrete variables, and a general multidimensional method.

18. Canceled.

19. (Original) A computer-readable storage medium as claimed in claim 17 wherein said executable code instructs said computer to perform further operations comprising:

specifying a plurality of values for a strategic factor, said strategic factor being configured to adjust an influence that said strategic objective has on said planning model;

coupling said strategic objective function with said strategic factor; and

optimizing said independent planning functions for each of said values of said strategic factor.

20. (Original) A computer-readable storage medium as claimed in claim 17 wherein said strategic objective is a first strategic objective, and said executable code instructs said computer to perform further operations comprising:

defining a second strategic objective function describing a second strategic objective of said enterprise, said second strategic objective function including a second subset of said decision variables;

incorporating said second strategic objective function within said planning function; and

providing an interaction of said primary objective function, said first strategic objective function, and said second strategic objective function.

21. (Currently Amended) A method of computing decisions ~~in a computing environment~~ for a set of decision variables of a planning model characterizing an enterprise, said planning model incorporating a primary objective of said enterprise, said method comprising:

defining, in a processing section having one or more processors, a primary objective function describing said primary objective, said primary objective function including said set of decision variables;

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generating, in said processing section, a planning function describing said planning model, said planning function including said primary objective function, and said planning function depending upon said set of decision variables;

determining, in said processing section, a coupling between said decision variables in said primary objective function;

introducing, in said processing section, an embedded constraint into said primary objective function;

separating, in said processing section, said planning function into independent planning functions, each of said independent planning functions depending upon different ones of said set of decision variables, said independent planning functions including said embedded constraint;

independently optimizing each of said independent planning functions in said computing environment in said processing section to obtain said decisions for said different ones of said set of decision variables, said optimizing operation optimizing said primary objective function while concurrently satisfying said embedded constraint, wherein said independently optimizing operation comprises selecting an optimization algorithm from a group comprising a closed form solution, a one dimensional maximization of continuous decision variables, a one dimensional maximization of discrete variables, and a general multidimensional method; and

presenting at controlling said processing section to cause an output section of ~~said~~ a computing environment to present said decisions for said different ones of said set of decision variables that optimize said each of said independent planning functions.

22. (Original) A method as claimed in claim 21 wherein said generating operation defines said planning function to include a non-linear function of at least one of said decision variables.

23. (Original) A method as claimed in claim 21 wherein:  
said introducing operation comprises:



including an embedded constraint variable for said embedded constraint in said primary objective function; and

defining a embedded constraint function to include said embedded constraint variable;

said generating operation comprises constructing said planning function by combining said primary objective function and said embedded constraint function; and

said independently optimizing operation comprises providing said decisions which optimize said primary objective function while concurrently satisfying said embedded constraint function.

### **Reasons for Allowance**

5. The following is an examiner's statement of reasons for allowance: None of the prior art of record, taken individually or in any combination, teach, *inter alia*, separating in said processing section said planning function into independent planning function, each of said independent planning functions depending upon different ones of said set of decision variables and independently optimizing each of said independent planning functions in said processing section to obtain said decisions for said different ones of said set of decision variables.

6. The prior art most closely resembling Applicant's claimed invention is Ouimet et al (US Patent No. 6308162) and Elad et al (US Patent No. 51951172).

7. Ouimet teaches a method for controlled optimization of enterprise planning models comprising multiple objective functions that depend on the same variables as

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the model. However, Ouimet fails to teach separating in said processing section said planning function into independent planning function, each of said independent planning functions depending upon different ones of said set of decision variables and independently optimizing each of said independent planning functions in said processing section to obtain said decisions for said different ones of said set of decision variables.

8. Elad teaches a system and method for representing and solving numeric and symbolic problems, comprising a problem solving engine that builds a numerical model from objective and constraint functions affected by decision variables for solving. However, Elad fails to teach, separating in said processing section said planning function into independent planning function, each of said independent planning functions depending upon different ones of said set of decision variables and independently optimizing each of said independent planning functions in said processing section to obtain said decisions for said different ones of said set of decision variables.

9. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

10. The prior art made of record and is considered pertinent to applicant's disclosure.

Jensen et al, "Application of Linear Decomposition Technique in Reliability-Based Structural Optimization", 1992, Springer /Berlin, Volume 180/1992.

Dietrich et al (US Patent No. 5,630,070), regarding the optimization of manufacturing resource planning involving objective and constraint functions.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRANDI P. PARKER whose telephone number is (571) 272-9796. The examiner can normally be reached on Mon-Thurs. 8-5pm.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley B. Bayat can be reached on (571) 272-6704. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRANDI P PARKER/  
Examiner, Art Unit 3624

/Bradley B Bayat/

Supervisory Patent Examiner, Art Unit 3624